Two Tower Center Blvd.
10th Floor
East Brunswick, New Jersey 08816

CHEMICAL LAND HOLDINGS, INC.

October 23, 2001

U.S. Environmental Protection Agency, Region II
Emergency and Remedial Response Division
290 Broadway, 19th Floor, Room W-20
New York, NY 10007-1866

Attention: Ms. Janet Conetta
Strategic Integration Manager

Subject: Meeting Notes – CSO Meeting (October 18, 2001)
Passaic River Study Area
Administrative Order on Consent Index No. II-CERCLA-0117

Dear Ms. Conetta:

Please find enclosed notes of the meeting between representatives of the United States Environmental Protection Agency (EPA) and Chemical Land Holdings (CLH) held on October 18, 2001 at CLH's East Brunswick, NJ office.

Sincerely,

C. Firstenberg

Clifford E. Firstenberg
Project Manager
On behalf of Occidental Chemical Corporation
(as successor to Diamond Shamrock Chemicals Company)

enclosure

(2 copies sent)

2c: Section Chief
NJDEP-Bureau of Federal Case Management
401 East State Street - CN 028
Trenton, NJ 08625-0028
Attn: Jonathan D. Berg

1c: Chief, New Jersey Superfund Branch
Office of Regional Counsel
U.S. Environmental Protection Agency
290 Broadway, 19th Floor, Room W-20
New York, NY 10007-1866
Attention: Diamond Alkali Site Attorney - Passaic River Study Area

1c: U.S. Environmental Protection Agency, Region II
Emergency and Remedial Response Division
290 Broadway, 19th Floor, Room W-20
New York, NY 10007-1866
Attention: Mr. Rick Winfield

1c: U.S. Environmental Protection Agency, Region II
Emergency and Remedial Response Division
290 Broadway, 19th Floor, Room W-20
New York, NY 10007-1866
Attention: Ms. Sharon Jaffess

- There was a dioxin modeling study of Lake Ontario.
- Bill Richardson of the Large Lakes Research Center is a good contact for references or studies [ACTION: R. Winfield to contact Richardson for references.]

C. Firstenberg reviewed recent timeline of CSO program:

July 1999	ESP, including CSO, submitted to EPA
November 1999 – March 2000	CSO Trial Run and Reconnaissance
May 2000	Centrifugation test
June 2000	CSO Trial Run Recommendation report submitted to EPA
September 2000	Centrifugation test summary submitted to EPA
December 2000	Revised CSO Field Sampling Plan (FSP) submitted to EPA (included modifications resulting from PVSC comments and Trial Run)
February 2001	Meeting with EPA, NJDEP, PVSC, and PVSC's consultants
October 2001	Revised draft QAPP and submitted to EPA in anticipation of October 18, 2001 meeting.

R. Winfield explained that EPA will be submitting CLH's information request tables contained in October 11, 2001 letter to PVSC. EPA will follow-up with a 104(e) request if PVSC does not cooperate.

2. Analytical Protocols

D. Waldschmidt handed-out an expanded outline: "Analytical Protocols" (attached).

D. Waldschmidt explained that the draft QAPP had been provided to R. Winfield, inclusive of analytical procedures new to the CSO program, but exclusive of previously reviewed and EPA-approved methods. R. Winfield asked for copies of the methods previously approved by EPA, and a second, full copy of both volumes. [ACTION: CLH will provide a separate 3-ring binder with these methods; EPA will provide Edison office with copies for review and approval.]

D. Waldschmidt explained the meaning of the "hybrid" program – it is combination of those methods that CARP is using that are improvements over the methods CLH has traditionally used under CERCLA. However, only documented/accepted methods have been used in the hybrid, whereas CARP has used laboratory-specific methods that are not

MEETING NOTES
Passaic River RI/FS – CSO Technical Meeting
Chemical Land Holdings
East Brunswick, NJ
October 18, 2001
9:00 AM – 1:30 PM

ADMINISTRATIVE ITEMS

Attendees

Chemical Land Holdings	U.S. EPA
Firstenberg – Project Manager (CLH)	Jaffess – Co-Project Manager (EPA)
Hebert (CLH/BBL)	Winfield – Co-Project Manager (EPA)
McNutt (CLH)	
Romagnoli (CLH/BBL)	
Waldschmidt (CLH/EDS)	
Wolfskill (CLH/Consultant)	

Attachments to Meeting Notes

- Meeting Agenda
- Sign-in Sheet
- Analytical Protocols
- Analytical Procedures Comparison Table - Specific Comments

MEETING NOTES

1. Introduction

The meeting followed the agenda, which is included as an attachment to these meeting notes.

R. Winfield began with an update of the Contaminant Assessment Reduction Program (CARP) CSO program.

- R. Winfield and S. Jaffess met with Mr. Joel Pecchioli, NJDEP, NJ Toxics Reduction Program. Following are notable issues:
  - TOPS samplers have problems
  - The TOPS sampler has been modified to have a double-stage filter to mitigate the impact of breakthrough.
  - The NJ CARP field program is on schedule; more sampling scheduled this fall.
  - Data from the sampling program are a long way off.

R. Winfield discussed Great Lakes Environmental Center (GLEC) versus research activities in the Great Lakes region.

- The Niagara River Mass Balance Study may be useful.

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as rigorously developed nor reviewed as the methods developed by CLH. All of the methods in the hybrid QAPP conform to EPA requirements.

There has been a positive impact to development of this QAPP. In many cases, even if a CARP method was not used, improved EPA or other methods were identified that provide for an expanded target analyte list (TAL) and in some cases, improved detection limits. In general, the current TAL is much larger than the CARP TAL, and somewhat larger than CLH's previous draft of the ESP (CSO) QAPP.

D. Waldschmidt's handout included tables comparing analytical methods for hybrid versus CARP. These tables were reviewed. Following are general comments, and the attached table (Analytical Procedures Comparison Tables; Specific Comments) provides additional comments specific to each analytical method/matrix.

- The following CARP methods have not been provided: Total Organic Carbon (TOC), Dissolved Organic Carbon (DOC), Inorganics, Mercury, Methyl-mercury, and Total Suspended Solids (TSS). [ACTION: EPA to request written methods or references from CARP.]
- Where the testing programs overlap, the "hybrid" and "CARP" analytical techniques are the same. The "hybrid" program places heavy emphasis on Agency-promulgated procedures that are standardized methods. In all cases no specific analytical methodologies were provided in the "CARP" documents provided for our review.
- The "hybrid" program emphasizes Agency-promulgated procedures that are standardized methods rather than laboratory-specific SOPs as is the case with "CARP."
- The "hybrid" program is based on standardized analytical methods without modification. In some cases the "CARP" program allows for modification of the referenced laboratory SOP. "Hybrid" program requires labs to perform MDL studies prior to sample analyses. MDLs are experimentally derived as specified in 40CFR, Chapter 1, Part136, 1990. The demonstrated MDL must be 3 to 5 times lower than the values listed in the "hybrid" program table.

The handout also provides tables comparing detection limits (DLs) between the two programs. In the Quantitation Limits tables the "CLH/CARP" column contains DLs that are 3-5 times greater than the performance demonstrated by the laboratory (see discussion of Method Detection Limit (MDL) study in following paragraph). The hybrid methods' DLs are generally improved over previous ESP QAPPs; however, they are not always better than the DLs quoted by CARP. However, the CARP is concentrating its sample using methods that are not allowed under 40CFR, and are also using mathematical manipulations to achieve lower "theoretical" DLs.

There is also an inconsistency between the CARP's stated concentration factors and the DLs that are achieved, which can be determined in at least in one case. For the PCB analyses, the CARP has exactly the same DLs as the hybrid program. However, this includes a 50,000-fold concentration factor, which CLH does not use. So it is unclear how the CARP is using the concentration methods and mathematically applying the result. By way of example, D. Waldschmidt explained that under the CLH program, laboratories are required to *demonstrate* their ability to achieve quoted DLs via the conduct of MDL studies using rigorous analytical procedures and according to the requirements of 40CFR. These analyses are repeated at least 7 times, and the results must fall within a specified range of standard deviations, or the lab must repeat the MDL study. CARP did not provide any backup to the development of their quoted DLs. CLH requested that EPA obtain the data from CARP to support their quoted DLs. [ACTION: EPA to request data from CARP to support quoted DLs. CLH to prepare explanation of apparent numerical inconsistency in CARP DLs and provide to EPA.]

D. Waldschmidt reviewed the filtration method used in the CSO Trial Run to harvest sediment from the whole water. She explained that it was impossible to separate the retained solids from the filter, and that the laboratories had to therefore digest and analyze the filters and retained sediment together. This affected the analytical results both through minor chemical influence from the filter material and significant moisture content since drying is not permitted under Agency protocols. The CLH team considered various alternatives/options, but centrifugation was clearly the only reasonable option.

CLH reviewed the results of the centrifuge test. R. Winfield was satisfied with the comparison of physical attributes of the retained sediment (i.e., similar grain size distribution), but expressed concern over the impact of centrifugation on the dissolved fraction (partitioning coefficients are a function of concentration and the force of the centrifuge). R. Romagnoli explained that Environment Canada uses this centrifuge for environmental investigations. C. Firstenberg committed to research the literature for information and provide feedback to R. Winfield. If appropriate studies have not been conducted, CLH will consider an additional experiment once the centrifuge is available to CLH. This potential experiment will evaluate total mass recovery, including organic carbon, and possibly a comparison of "before" and "after" chemical concentrations.

D. Waldschmidt explained that the Method Evaluation program would compare the results of the first CSO sampling to be conducted to determine which analytical groups will be analyzed from an aqueous matrix and which will be derived from a solids matrix. The five evaluation criteria CLH plans to use are:

1. Detection limit comparisons
2. Chemical mass comparisons
3. Percent usable data after validation

4. Logistics of sample collection
5. Cost

R. Winfield asked about duplicates and rinsates, and about QC sample collection frequency. Tables 9-1 and 9-2 from the draft QAPP were reviewed. R. Winfield suggested that CLH consider Performance Evaluation (PE) samples for other chemical groups in addition to PCDDs/PCDFs. In addition, he suggested CLH consider spiked analyses.

3. Field Program

A. Hebert provided an overview of the field program and the results of the Trial Run and the Reconnaissance. He then explained the revised field program that includes the use of "Clean" sampling methods. CLH will be using large peristaltic pumps or food-grade pumps to achieve the necessary flow rate yet not contaminate the sample at the very sensitive DLs that are being achieved (metals only). A new Standard Operating Procedure (SOP) has been added for "clean" sampling.

CLH is waiting for responses from PVSC and the City of Newark (per the request lists provided to EPA in its October 11, 2001 letter). This would include the results of Storm Water Management (SWM) modeling being conducted by HydroQual for PVSC and by LMS for the City of Newark.

R. Winfield provided clarification of "Time-variable watershed loads." His concern is that there are many "batch" processing industries in Newark and if we sample for a limited time during the first part of the discharge hydrograph, we may miss some of the load that could occur thereafter. The team needs more information from PVSC regarding modeling (travel times from industry to CSO) and types of industries within each watershed, before a decision can be made on extending the sample collection duration (presently, the sample will be collected during a 3-4 hour period subject to the pump flow rate).

R. Winfield asked if CLH had ever reviewed the Sludge Quality Assurance Reports (SQARs), which the PVSC is required to submit to NJDEP, probably on a monthly basis. These contain the results of full priority pollutant scans of the sludge the PVSC sends for disposal. He suggested CLH review these for historical "hits" to develop a record of what has been passing through the PVSC. [ACTION: Both CLH and EPA will attempt to obtain the SQARs.]

R. Winfield asked if CLH would consider analyzing split samples from CARP to obtain a direct comparison of the analytical results. CLH indicated its willingness to conduct analyses on split samples.

C. Firstenberg reviewed the proposed schedule:

- CLH will finalize the FSP and submit to EPA within a few weeks. R. Winfield requested that both the FSP and QAPP be identified as "draft" and contain the name of the company author (i.e., CLH). In addition, it would be useful if the consulting firm responsible for developing the document were listed also.
- While EPA is reviewing the FSP and QAPP, a series of meetings will be required: CLH and EPA; CLH, PVSC, and EPA; and CLH, City of Newark, and EPA.
- Mobilization is subject to procurement of the sampling equipment and especially the centrifuge. CLH explained the unique situation regarding the sole developer of this centrifuge.
- The 3 months for the Evaluation Program allow for lab analyses, validation, and development of a report to EPA.

4. Next Steps

- Begin regular project team meetings between EPA and CLH to possibly include sediment transport modeling and PRP issues as well as CSO.
- CLH and D. Waldschmidt are prepared to meet with EPA-Edison to review the QAPP and respond to questions. This should expedite EPA approval of the draft QAPP.

5. Action Items

CLH

- Provide a separate 3-ring binder with methods previously approved by EPA.
- Submit draft Field Sampling Plan.
- Prepare explanation of apparent numerical inconsistency in CARP DLs and provide to EPA.
- Research literature for centrifugation performance.
- Request Sludge Quality Assurance Reports (SQARs) from NJDEP.

EPA

- R. Winfield to contact Richardson for references.
- Provide Edison office with copies of the QAPP for review and subsequent approval by EPA.
- Request written methods or references from CARP.
- Request data from CARP to support quoted DLs.
- Request Sludge Quality Assurance Reports (SQARs) from PVSC.
- Request that CARP provide more detailed field methods and/or SOPs, or allow CLH to attend a sampling event to develop understanding of CARP field methods.
- Arrange for a technical meeting with PVSC (need to discuss Access Agreement during this meeting.
- Arrange for a technical meeting with the City of Newark.

C:\Files\Projects\AOC\CSO\Meetings\10-18-01\Meeting Notes.doc

AGENDA
CSO Meeting
CLH – EPA
East Brunswick, NJ
October 18, 2001 – 9:00 AM

ATTENDEE LIST

CLH	EPA
Clifford Firstenberg – CLH Project Manager	Sharon Jaffess – Project Manager
Alain Hebert – BBL Engineer	Richard Winfield – Project Manager
Richard McNutt – CLH Manager	
Robert Romagnoli – BBL Engineer/PM	
Diane Waldschmidt – EDS Chemist	
Tony Wolfskill – Senior Advisor	

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1. INTRODUCTION

1.1. Update on CARP CSO Program [EPA]

1.2. Update on CLH CSO Program [CLH]

2. ANALYTICAL PROTOCOLS

2.1. Overview of draft hybrid CLH/CARP analytical protocols and QAPP [CLH]

2.2. Comparison: NJDEP/HEP/CARP versus draft hybrid CLH/CARP (including trace chemicals) [CLH]

2.2.1. Analytical methods

2.2.2. Target analyte lists

2.2.3. Detection Limits

2.3. Sediment Separation Method [CLH]

2.3.1 Review results of filtration method

2.3.2 Rationale for Selection of Centrifugation

2.4. CLH/CARP Method Evaluation [CLH]

AGENDA
CSO Meeting
CLH – EPA
East Brunswick, NJ
October 18, 2001 – 9:00 AM
(continued)

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3. FIELD PROGRAM

3.1. Overview of CSO Field Program [CLH]

- 3.1.1. Summarize Reconnaissance
- 3.1.2. Results of Trial Run

3.2. Revised ESP CSO Field Sampling Program [CLH]

- 3.2.1. Purpose (hybrid CLH/CARP program)
- 3.2.2. CLH understanding of the CARP FSP
- 3.2.3. FSP/QAPP Overview of revised (hybrid) sampling program

3.3. CSO Sampling Program/Strategy [CLH]

- 3.3.1. Current ESP CSO sampling strategies ("wet"/"dry" storm events)
- 3.3.2. Alternative CSO sampling strategies
  - Input from PVSC and City of Newark
  - Based on results of initial sampling

3.4. Time-variable watershed loads [EPA]

3.5. Schedule (subject to storm events, access agreements, etc.) [CLH]

- 3.5.1. Submit modified FSP and QAPP to EPA (subject to today's meeting)
- 3.5.2. EPA Review/Revisions/Approval
- 3.5.3. Premobilization Activities (meetings with EPA and PVSC)
- 3.5.4. Mobilize (2 months after EPA approval)
- 3.5.5. CLH/CARP Evaluation Program (3 months)
- 3.5.6. Full Sampling and Analytical Program (9-12 months)

4. NEXT STEPS

MEETING: Diamond Alkali Superfund Site
Passaic River Study Area

Date: 10/18/01

Subject: CSO - technical.

Location: CLH/New Brunswick.

	NAME	ORGANIZATION	TELEPHONE	e-mail
1	Rick Winfield	US EPA	(212) 637-4362	winfield.richard@epa.gov
2	Bob Romagnoli	BBL - Rep. CLH	(315) 446-9120	RR@BBL-INC.COM
3	Alain Hebert	BBL Rep. CLH	(609) 860-0590	APH@BBL-INC.COM
4	Tony Wolfskill	Consultant- CLH	(936) 891-5102	lawolfskill@earthlink.net
5	Diane Waldschmidt	Consultant (EDS)	(412) 486-9121	EDATAS@AOL.COM
6	Rick McNutt	CLH	(732) 246-5849	RmcNUTT354@aol.com
7	Cliff Firstenberg	CLH	(757) 258-7720	clifford.firstenberg@home.com
8	Sharon Jaffess	US EPA	(212) 637-4396	jaffess.sharon@epa.gov
9			( ) -	
10			( ) -	
11			( ) -	
12			( ) -	
13			( ) -	
14			( ) -	
15			( ) -	
16			( ) -	

ANALYTICAL PROTOCOLS

2.1 Overview of draft hybrid CLH/CARP analytical protocols and QAPP

2.1.1 Hybrid CLH/CARP QAPP is comprehensive

2.1.2 Expanded target analyte lists

2.1.3 CLH plan to separate solid and whole water matrices is preserved

2.1.4 CARP analytical methods have been incorporated into existing CLH analytical protocols

2.1.5 Changes in sample handling procedures

2.2 Comparison: NJDEP/HEP/CARP vs. draft hybrid CLH/CARP (including trace chemicals)

2.2.1 Analytical Methods

2.2.2 Target Analyte Lists

2.2.3 Detection Limits

2.3 Sediment Separation Method

2.3.1 Review results of filtration method

2.3.2 Rationale for selection of Centrifugation

2.4 CLH/CARP Method Evaluation

2.4.1 Detection limit comparisons (frequency of detects)

2.4.2 Comparison of calculated loading to the river values

2.4.3 Percent usable data obtained

2.4.4 Logistics of sample collection

2.4.5 Cost

Analytical Methods
Organic Chemicals (Liquid Matrix)

Parameter	Technique	NJDEP HEP/CARP Analysis Method		CLH/CARP Analysis Method
HRGC/LRMS/SIM PAHs	HRGC/LRMS	Battelle SOP 5-157		B&B, SOP 1003/ GERG, 1998
Semivolatile Organics	GC/MS	N/A		3550B/8270C
Pesticides	HRGC/HRMS	Battelle SOP ASAT. 11-008-00 Draft		NYSDEC HRMS-2
Aroclor PCBs	GC	N/A		3520C/8082
PCB Congeners and Homologues	HRGC/HRMS	Battelle SOP ASAT. 11-009-00 Draft		INC/1668A
Chlorinated Herbicides	GC	N/A		INC/8151A
PCDDs/PCDFs	HRGC/HRMS	Battelle SOP ASAT. 11-001-01 Battelle SOP ASAT. 11-002-01		INC/1613A
Organotin	GC	N/A		NOAA, 1993
TEPH	GC	N/A		CALUFT, 1988
Total Organic Carbon (TOC)	Carbonaceous Analyzer	N/P		INC/9060
Dissolved Organic Carbon (DOC)	Carbonaceous Analyzer	N/P		INC/9060

NA – Not applicable because the target analytes are not part of the CARP program.
NP – Not provided by CARP.

Analytical Methods
Organic Chemicals (Solid Matrix)

Parameter	Technique	NJDEP HEP/CARP Analysis Method		CLH/CARP Analysis Method
HRGC/LRMS/SIM PAHs	HRGC/LRMS	Water only		B&B, SOP 1003/ GERG, 1998
Semivolatile Organics	GC/MS	N/A		3550B/8270C
Pesticides	HRGC/HRMS	Water only		NYSDEC HRMS-2
Aroclor PCBs	GC	N/A		3550B/8082
PCB Congeners and Homologues	HRGC/HRMS	Water only		INC/1668A
Chlorinated Herbicides	GC	N/A		INC/8151A
PCDDs/PCDFs	HRGC/HRMS	Water only		INC/1613A
Organotin	GC	N/A		NOAA, 1993
TEPH	GC	N/A		CALUFT, 1988
Total Organic Carbon (TOC)	Carbonaceous Analyzer	Water only		INC/Lloyd Kahn

NA – Not applicable because the target analytes are not part of the CARP program.

Analytical Methods
Inorganic Chemicals (Liquid Matrix)

Parameter	Technique	NJDEP HEP/CARP Analysis Method		CLH/CARP Analysis Method
Inorganics	ICPMS/ICP	NP		INC/1638/6010
Mercury	CVAFS	NP		INC/1613
Cyanide	Titration/ Colorimetric	N/A		9010B/9013/9014
Methyl-mercury	CVAFS	N/P		INC/Draft 1630 (1998)
Total Suspended Solids (TSS)	Gravimetric	N/P		160.2

NA – Not applicable because the target analytes are not part of the CARP program.
NP – Not provided by CARP.

Analytical Methods
Inorganic Chemicals (Solid Matrix)

Parameter	Technique	NJDEP HEP/CARP Analysis Method		CLH/CARP Analysis Method
Inorganics	ICP	*Water only (small list)*		3050/6010
Mercury	CVAA	Water only		INC/7471A
Cyanide	Titration/ Colorimetric	N/A		9010B/9013/9014
Grain Size	Malvern Mastermizer S. Laser Diffractor	N/A		PTL Test Method
Percent Moisture	Gravimetric	N/A		*ASTM, 1980*

NA – Not applicable because the target analytes are not part of the CARP program.

Method 1668 Rev. A Quantitation Limits for PCB Congeners
(Page 1 of 2)

Parameter	CLH/CARP (pg/L)1	THEORETICAL HEP/CARP (pg/L)2	Parameter	CLH/CARP (pg/L)1	THEORETICAL HEP/CARP (pg/L)2
PCBs			***PCBs***		
PCB3	200	200	PCB52	500	500
PCB4	500	500	PCB53	200	200
PCB5	50	50	PCB56	200	200
PCB8	500	500	PCB59	200	200
PCB10	50	50	PCB60	500	500
PCB11	200	200	PCB62	200	200
PCB15	500	500	PCB63	500	500
PCB16	100	100	PCB64	200	200
PCB17	200	200	PCB66	500	500
PCB18	500	500	PCB70	500	500
PCB19	100	100	PCB74	500	500
PCB22	200	200	PCB75	200	200
PCB25	200	200	PCB77	500	500
PCB26	200	200	PCB81	500	500
PCB27	200	200	PCB82	500	500
PCB28	500	500	PCB84	500	500
PCB31	500	500	PCB85	200	200
PCB32	200	200	PCB86	500	500
PCB33	200	200	PCB87	500	500
PCB37	500	500	PCB91	500	500
PCB40	500	500	PCB92	500	500
PCB42	200	200	PCB95	500	500
PCB43	200	200	PCB97	500	500
PCB44	500	500	PCB99	500	500
PCB45	200	200	PCB101	1000	1000
PCB46	200	200	PCB104	500	500
PCB47	500	500	PCB105	200	200
PCB48	200	200	PCB110	1000	1000

Method 1668 Rev. A Quantitation Limits for PCB Congeners (continued)
(Page 2 of 2)

Parameter	CLH/CARP (pg/L)1	THEORETICAL HEP/CARP (pg/L)2	Parameter	CLH/CARP (pg/L)1	THEORETICAL HEP/CARP (pg/L)2
PCBs			***PCBs***		
PCB49	500	500	PCB114	500	500
PCB50	200	200	PCB118	500	500
PCB119	500	500	PCB172	1000	1000
PCB120	500	500	PCB174	500	500
PCB123	500	500	PCB177	500	500
PCB126	500	500	PCB178	500	500
PCB128	500	500	PCB179	500	500
PCB132	500	500	PCB180	500	500
PCB134	500	500	PCB183	1000	1000
PCB135	500	500	PCB185	1000	1000
PCB136	200	200	PCB187	500	500
PCB137	1000	1000	PCB188	500	500
PCB138	500	500	PCB189	500	500
PCB141	200	200	PCB190	500	500
PCB146	500	500	PCB191	1000	1000
PCB149	500	500	PCB194	500	500
PCB151	500	500	PCB195	1000	1000
PCB153	500	500	PCB196	1000	1000
PCB154	500	500	PCB198	500	500
PCB156	500	500	PCB199	500	500
PCB157	500	500	PCB200	1000	1000
PCB158	200	200	PCB201	1000	1000
PCB166	500	500	PCB203	1000	1000
PCB167	500	500	PCB205	1000	1000
PCB168	500	500	PCB206	1000	1000
PCB169	500	500	PCB207	1000	1000
PCB170	500	500	PCB208	1000	1000
PCB171	1000	1000	PCB209	500	500

NOTES:

1 CLH will require laboratories to perform MDL studies prior to sample analyses.
Reporting limits based on the estimated minimum levels (EML) listed in Method 1668, Rev. A, Table 2. These values will be adjusted based on the outcome of the method detection limit demonstration required to be performed by the laboratory.

2 Obtained from the Quality Assurance Project Plan(QAPP), Field Sampling and Analytical Support for the NJ Toxics Reduction Program, Study I-G, POTW,CSO and SWO Sampling and Analysis, GLEC, July 21, 2000.

(HRGC/HRMS) Quantitation Limits for Pesticides

Compounds	CLH/CARP (µg/L)1	THEORETICAL HEP/CARP (µg/L)2
Aldrin	.001	.0002
BHC-alpha	.001	.0002
BHC-beta	.001	.0002
BHC-gamma (Lindane)	.001	.0002
Chlordane-alpha (cis)	.001	.0002
Chlordane-gamma (trans)	.001	.0002
Chlordane-oxy	.001	.0002
Dieldrin	.001	.0002
2,4'-DDD	.001	.0002
4,4'-DDD	.001	.0002
2,4'-DDE	.001	.0002
4,4'-DDE	.001	.0002
2,4'-DDT	.001	.0002
4,4'-DDT	.001	.0002
Endosulfan-alpha	.001	.0002
Endosulfan-beta	.001	.0002
Endosulfan sulfate	.001	.0002
Endrin	.001	.0002
Endrin aldehyde	.001	.0002
Endrin ketone	.001	.0002
Heptachlor	.001	.0002
Heptachlor epoxide	.001	.0002
Hexachlorobenzene	.001	.0002
Methoxychlor	.001	.0002
Mirex	.001	.0002
Nonachlor-cis	.001	.0002
Nonachlor-trans	.001	.0002

NOTES:

1 Actual MDL's are experimentally derived as specified in 40CFR, Chapter 1, Part 136, and Appendix B, 1990. The laboratory's MDL must be 3 to 5 times lower than the quantitation limits listed herein.

2 Obtained from the Quality Assurance Project Plan(QAPP), Field Sampling and Analytical Support for the NJ Toxics Reduction Program, Study I-G, POTW,CSO and SWO Sampling and Analysis, GLEC, July 21, 2000.

2.2.2 and 2.2.3

Method 1613A Representative Quantitation Limits for PCDD/PCDFs

PCDD/PCDF Parameters	CAS #	Quantitation Limits	
		CLH/CARP (pg/L)1	Theoretical HEP/CARP (pg/L)2
2,3,7,8-TCDD	1746-01-6	10	2
1,2,3,7,8-PeCDD	40321-76-4	50	10
1,2,3,4,7,8-HxCDD	39227-28-6	50	10
1,2,3,6,7,8-HxCDD	57653-85-7	50	10
1,2,3,7,8,9-HxCDD	19408-74-3	50	10
1,2,3,4,6,7,8-HpCDD	35822-46-9	50	10
OCDD	3268-87-9	100	20
2,3,7,8-TCDF	51207-319	10	2
1,2,3,7,8-PeCDF	57117-41-6	50	10
2,3,4,7,8-PeCDF	57117-31-4	50	10
1,2,3,4,7,8-HxCDF	70648-26-9	50	10
1,2,3,6,7,8-HxCDF	57117-44-9	50	10
2,3,4,6,7,8-HxCDF	60851-34-5	50	10
1,2,3,7,8,9-HxCDF	72918-21-9	50	10
1,2,3,4,6,7,8-HpCDF	67562-39-4	50	10
1,2,3,4,7,8,9-HpCDF	55673-89-7	50	10
OCDF	39001-02-0	100	20

NOTES:

1 Detection limits listed are based on the minimum level at which the analytical system will give acceptable selected ion current profiles (SICPs) and calibration as specified in the method. Detection limits are sample and matrix specific and are calculated based on peak height or area of the signal for the internal standard and the noise level associated with the target analyte measurement. Actual detection limits obtained for analysis of field samples may be higher.

TCDD = Tetrachlorodibenzo-p-dioxin
PeCDD = Pentachlorodibenzo-p-dioxin
HxCDD = Hexachlorodibenzo-p-dioxin
HpCDD = Heptachlorodibenzo-p-dioxin
OCDD = Octachlorodibenzo-p-dioxin
TCDF = Tetrachlorodibenzofuran
PeCDF = Pentachlorodibenzofuran
HXCDF = Hexachlorodibenzofuran
HpCDF = Heptachlorodibenzofuran
OCDF = Octachlorodibenzofuran

2 Obtained from the Quality Assurance Project Plan(QAPP), Field Sampling and Analytical Support for the NJ Toxics Reduction Program, Study I-G, POTW,CSO and SWO Sampling and Analysis, GLEC, July 21, 2000.

2.2.2 and 2.2.3

Method 8270M (GC/MS/SIM) Quantitation Limits for PAHs and Alkylated Homologues
(Page 1 of 2)

Compound	CLH/CARP (ng/L)1	THEORETICAL HEP/CARP (ng/L)2
Naphthalene	25	3.33
C1-Naphthalenes	25	3.33
C2-Naphthalenes	*50	3.33
C3-Naphthalenes	*50	3.33
C4-Naphthalenes	*50	NA
Acenaphthylene	25	3.33
Acenaphthene	25	3.33
Biphenyl	25	3.33
Fluorene	25	3.33
C1-Fluorenes	*50	NA
C2-Fluorenes	*50	NA
C3-Fluorenes	*50	NA
Phenanthrene	25	3.33
Anthracene	25	3.33
C1-Phenanthrenes/anthracenes	*50	3.33
C2-Phenanthrenes/anthracenes	*50	3.33
C3-Phenanthrenes/anthracenes	*50	NA
C4-Phenanthrenes/anthracenes	*50	NA
Dibenzothiophene	25	NA
C1-Dibenzothiophenes	*50	NA
C2-Dibenzothiophenes	*50	NA
C3-Dibenzothiophenes	*50	NA
Fluoranthene	25	3.33
Pyrene	25	3.33
C1-Fluoranthenes/pyrenes	*50	NA
C2-Fluoranthenes/pyrenes	*50	NA
C3-Fluoranthenes/pyrenes	*50	NA
Benzo[a]anthracene	25	3.33

Method 8270M (GC/MS/SIM) Quantitation Limits for PAHs and Alkylated Homologues (continued)
(Page 2 of 2)

Compound	CLH/CARP (ng/L)1	THEORETICAL HEP/CARP (ng/L)2
Chrysene	25	3.33
C1-Chrysenes	*50	NA
C2-Chrysenes	*50	NA
C3-Chrysenes	*50	NA
C4-Chrysenes	*50	NA
Benzo[b]fluoranthene	25	3.33
Benzo[k]fluoranthene	25	3.33
Benzo[e]pyrene	25	3.33
Benzo[a]pyrene	25	3.33
Perylene	25	3.33
Indeno [1,2,3-c,d] pyrene	25	3.33
Dibenzo [a,h] anthracene	25	3.33
Benzo [g,h,i] perylene	25	3.33
Methylnaphthalene	25	3.33
2,6-Dimethylnaphthalene	25	3.33
2,3,5-Trimethylnaphthalene	NA	3.33
1,6,7-Trimethylnaphthalene	25	3.33
1-Methylphenanthrene	25	3.33

NOTES:

1 Actual MDL's are experimentally derived as specified in 40CFR, Chapter 1, Part 136, and Appendix B, 1990. The laboratory's MDL must be 3 to 5 times lower than the quantitation limits listed herein.

2 Obtained from the Quality Assurance Project Plan(QAPP), Field Sampling and Analytical Support for the NJ Toxics Reduction Program, Study I-G, POTW,CSO and SWO Sampling and Analysis, GLEC, July 21, 2000.

* Quantitation limits for the extended alkylation groups have been derived based on those of the respective parent compound. Since actual standards are not available for these compounds, actual MDL's and quantitation limits cannot be experimentally derived as specified in 40CFR, Chapter 1, Part 136, and Appendix B, 1990. Instead, quantitation limits have been set at 2x that of the parent compound.

2.2.2 and 2.2.3

Required Detection Limits For Inorganics and Cyanide

Analyte	Method[2]	CLH/CARP (ug/L)1	NJDEP HEP/CARP (ug/L)
Aluminum, Al	6010B	200	NA
Antimony, Sb	1638	0.02	NA
Arsenic, As	6010B	10	NA
Barium, Ba	6010B	200	NA
Beryllium, Be	6010B	5	NA
Cadmium, Cd	1638	0.1	**NP**
Calcium, Ca	6010B	5000	NA
Chromium, Cr	6010B	10	NA
Cobalt, Co	6010B	50	NA
Copper, Cu	1638	0.2	NA
Total Cyanide	9012	10	NA
Iron, Fe	6010B	100	NA
Lead, Pb	1638	0.05	**NP**
Magnesium, Mg	6010B	5000	NA
Manganese, Mn	6010B	15	NA
Mercury, Hg	1631	0.001	**NP**
Nickel, Ni	1638	1	NA
Potassium, K	6010B	5000	NA
Selenium, Se	1638	5	NA
Silver, Ag	1638	0.1	NA
Sodium, Na	6010B	5000	NA
Thallium, Tl	1638	0.02	NA
Vanadium, V	6010B	50	NA
Zinc, Zn	1638	0.5	NA

NOTES:

1 Specific quantitation limits are highly matrix dependent. The laboratory IDL on "clean" samples must be less than or equal to the quantitation limit. Quantitation limits listed for soil/sediment are based on wet weight.

Quantitation Limits For Other Analytes

Analyte	Method[2]	CLH/CARP(1)	Theoretical HEP/CARP
Total Organic Carbon (TOC)	Lloyd Kahn (soil) 9060 (Water)[3]	1 mg/L	NP
Dissolved Organic Carbon (DOC)	9060[3]	1 mg/L	NP
Total Suspended Solids (TSS)	160.2	10 mg/L	NP
TEPH (DRO)	CALUFT, 1988	1 mg/L	NA
Methyl-Mercury	Draft 1630	0.001 ug/l	NP

NOTES:

1 Specific quantitation limits are highly matrix-dependent. The laboratory's sample quantitation limit (SQL) must be 3 to 5 times the laboratory's MDL for that analyte, and the laboratory's SQL's must be equal to or lower than the quantitation limits listed herein.

Method 8270C (GC/MS) Quantitation Limits For Semivolatile Organics
Page 1 of 2

Compounds	CLH/CARP (µg/L)1	HEP/CARP (ug/L)
Phenol	10	NA
bis (2-Chloroethyl) ether	10	NA
2-Chlorophenol	10	NA
1,3-Dichlorobenzene	10	NA
1,4-Dichlorobenzene	10	NA
1,2-Dichlorobenzene	10	NA
2-Methylphenol	10	NA
2,2'-oxybis(1-chloropropane)	10	NA
4-Methylphenol	10	NA
N-Nitroso-di-n-dipropylamine	10	NA
Hexachloroethane	10	NA
Nitrobenzene	10	NA
Isophorone	10	NA
2-Nitrophenol	10	NA
2,4-Dimethylphenol	10	NA
bis (2-Chloroethoxy) methane	10	NA
2,4-Dichlorophenol	10	NA
1,2,4-Trichlorobenzene	10	NA
Naphthalene	10	NA
4-Chloroaniline	10	NA
Hexachlorobutadiene	10	NA
4-Chloro-3-methylphenol	10	NA
Hexachlorocyclopentadiene	10	NA
2-Methylnaphthalene	10	NA
2,4,6-Trichlorphenol	10	NA
2,4,5-Trichlorophenol	25	NA
2-Chloronaphthalene	10	NA
2-Nitroaniline	25	NA
Dimethylphthalate	10	NA
Acenaphthylene	10	NA

Method 8270C (GC/MS) Quantitation Limits For Semivolatile Organics (continued)
Page 2 of 2

Compounds	CLH/CARP (µg/L)1	HEP/CARP (µg/L)
2,6-Dinitrotoluene	10	NA
3-Nitroaniline	25	NA
Acenaphthene	10	NA
2,4-Dinitrophenol	25	NA
4-Nitrophenol	25	NA
Dibenzofuran	10	NA
2,4-Dinitrotoluene	10	NA
Diethylphthalate	10	NA
4-Chlorophenyl phenyl ether	10	NA
Fluorene	10	NA
4-Nitroaniline	25	NA
4,6-Dinitro-2-methylphenol	25	NA
N-nitrosodiphenylamine	10	NA
4-Bromophenyl-phenyl ether	10	NA
Hexachlorobenzene	10	NA
Pentachlorophenol	25	NA
Phenanthrene	10	NA
Anthracene	10	NA
Carbazole	10	NA
Di-n-butylphthalate	10	NA
Fluoranthene	10	NA
Pyrene	10	NA
Butylbenzylphthalate	10	NA
3,3'-Dichlorobenzidine	10	NA
Benz(a)anthracene	10	NA
Chrysene	10	NA
bis (2-Ethylhexyl) phthalate	10	NA
Di-n-octylphthalate	10	NA
Benzo(b)fluoranthene	10	NA
Benzo(k)fluoranthene	10	NA
Benzo(a)pyrene	10	NA
Indeno (1,2,3-cd) pyrene	10	NA
Dibenz(a,h)anthracene	10	NA
Benzo(g,h,i)perylene	10	NA

NOTES:
1 Actual MDL's are experimentally derived as specified in 40CFR, Chapter 1, Part 136, and Appendix B, 1990. The laboratory's MDL must be 3 to 5 times lower than the quantitation limits listed herein.

2.2.2 and 2.2.3

Method 8151A Quantitation Limits for Chlorinated Herbicides

Compounds	CLH/CARP (ug/L)1	NJDEP HEP/CARP (ug/L)
2,4-D	12	NA
2,4-DB	9.1	NA
2,4,5-TP (Silvex)	5.0	NA
2,4,5-T	5.0	NA

NOTES:

1 Actual MDL's are experimentally derived as specified in 40CFR, Chapter 1, Part 136, and Appendix B, 1990. The laboratory's MDL must be 3 to 5 times lower than the quantitation limits listed herein.

2.2.2 and 2.2.3

Method 8082 Quantitation Limits for Aroclor PCBs

Compounds	CLH/CARP (µg/L)1	NJDEP HEP/CARP (µg/L)
Aroclor-1016	1	NA
Aroclor-1221	1	NA
Aroclor-1232	1	NA
Aroclor-1242	1	NA
Aroclor-1248	1	NA
Aroclor-1254	1	NA
Aroclor-1260	1	NA

NOTES:

1 Actual MDL's are experimentally derived as specified in 40CFR, Chapter 1, Part 136, and Appendix B, 1990. The laboratory's MDL must be 3 to 5 times lower than the quantitation limits listed herein.

2.2.2 and 2.2.3

Quantitation Limits For Organotins
(NOAA, 1993)

Analyte	CLH/CARP (ug/L)1	NJDEP HEP/CARP (ug/L)
Monobutyltin	0.025	NA
Tributyltin	0.025	NA
Dibutyltin	0.025	NA
Tetrabutyltin	0.025	NA

NOTES:

1 Actual MDL's are experimentally derived as specified in 40CFR, Chapter 1, Part 136, and Appendix B, 1990. The laboratory's MDL must be 3 to 5 times lower than the quantitation limits listed herein.

ANALYTICAL PROCEDURES COMPARISON TABLES
SPECIFIC COMMENTS

TABLE NAME	COMMENTS FROM MEETING (10/18/01)
Analytical Methods Organic Chemicals (Solid Matrix)	• The pesticide technique has been changed from GC to HRGC/HRMS. This provides an increased target analyte list (nearly 50% greater) and lowered detection limits. • PCB Congener method has been updated to the latest version of EPA method 1668a -provides expanded target analyte list from 39 to 109.
Analytical Methods Inorganic Chemicals (Liquid Matrix)	• Methyl mercury has been added to the "hybrid" program. This is a "CARP" target. • Note typographical error in hybrid method "INC/1613" for Mercury; it should be "INC/1631"
Analytical Methods Inorganic Chemicals (Solid Matrix)	• The PTL method for grain size determination was added to the "hybrid" program to accommodate the limited mass of solid material expected to be available during CSO sample collection.
Method 1668 Rev. A Quantitation Limits for PCB Congeners	• "Hybrid" program has expanded TAL from 39 to 109. • The "CARP" program uses a mathematically derived Quantitation Limit. • Limits in this table are the same because both programs used quantitation limits from the table in the analytical method.
(HRGC/HRMS) Quantitation Limits for Pesticides	• The "CARP" program uses a mathematically derived Quantitation Limit. • Significantly improved detection limits (100x lower) have been achieved for pesticides listed in the "hybrid program" vs. the existing ESP QAPP.
Method 1613a Representative Quantitation Limits for PCDD/PCDFs	• "Hybrid" program assumes the use of the method-required Estimated Detection Limit (EDL). Each sample and each target not qualitatively identified is specifically measured against background noise. The limits provided in the table are the values that EDLs should not exceed. • The "CARP" program uses a mathematically derived Quantitation Limit.
Required Detection Limits for Inorganics and Cyanide	• Improved detection limits have been achieved for elements listed as 1638 technique in the "hybrid program".

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